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US 4601343 A

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(72) Inventor(s):
Kevin Karl Waddell
Michael Dennis Bullock
Joel Gray Hockaday
Tance Alan Jackson

(73) Proprietor(s):
Enventure Global Technology
(Incorporated in USA - Delaware)
16200-A Park Row, Houston, Texas 77084,
United States of America

(74) Agent and/or Address for Service:
Haseltine Lake & Co
Redcliff Quay, 120 Redcliff Street,
BRISTOL, BS1 6HU, United Kingdom

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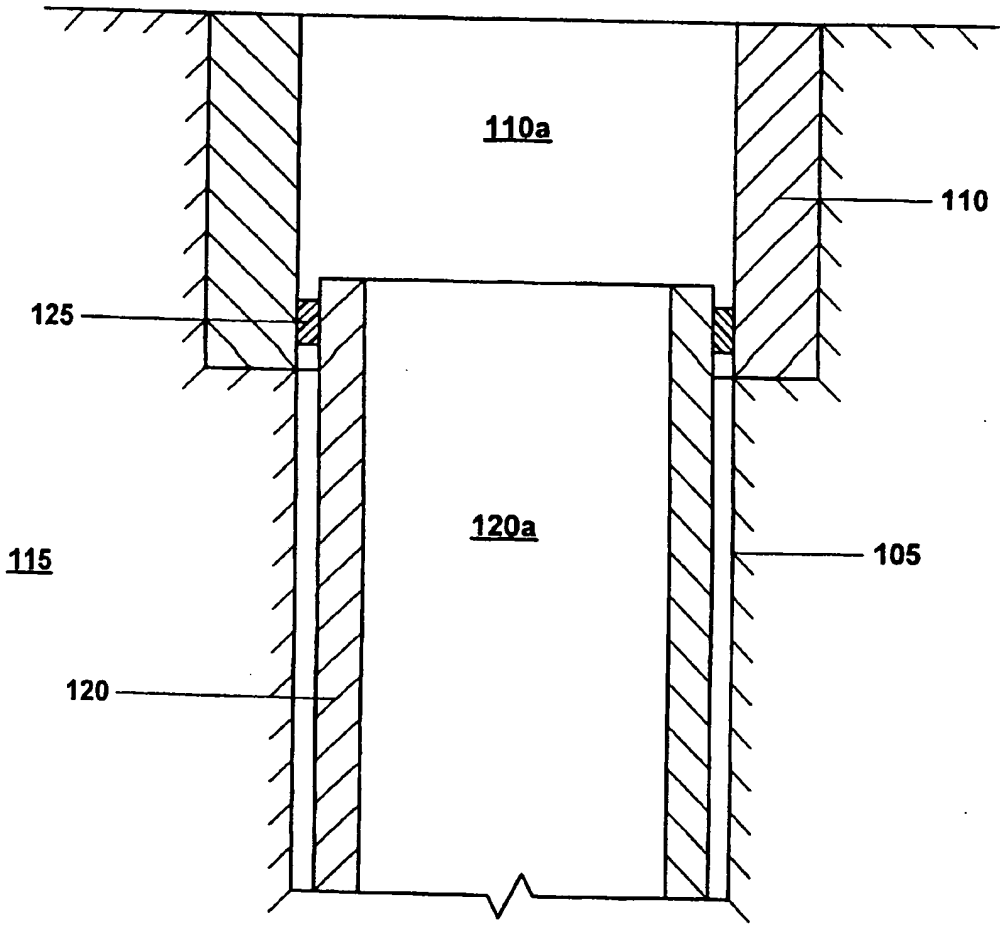


Fig. 1

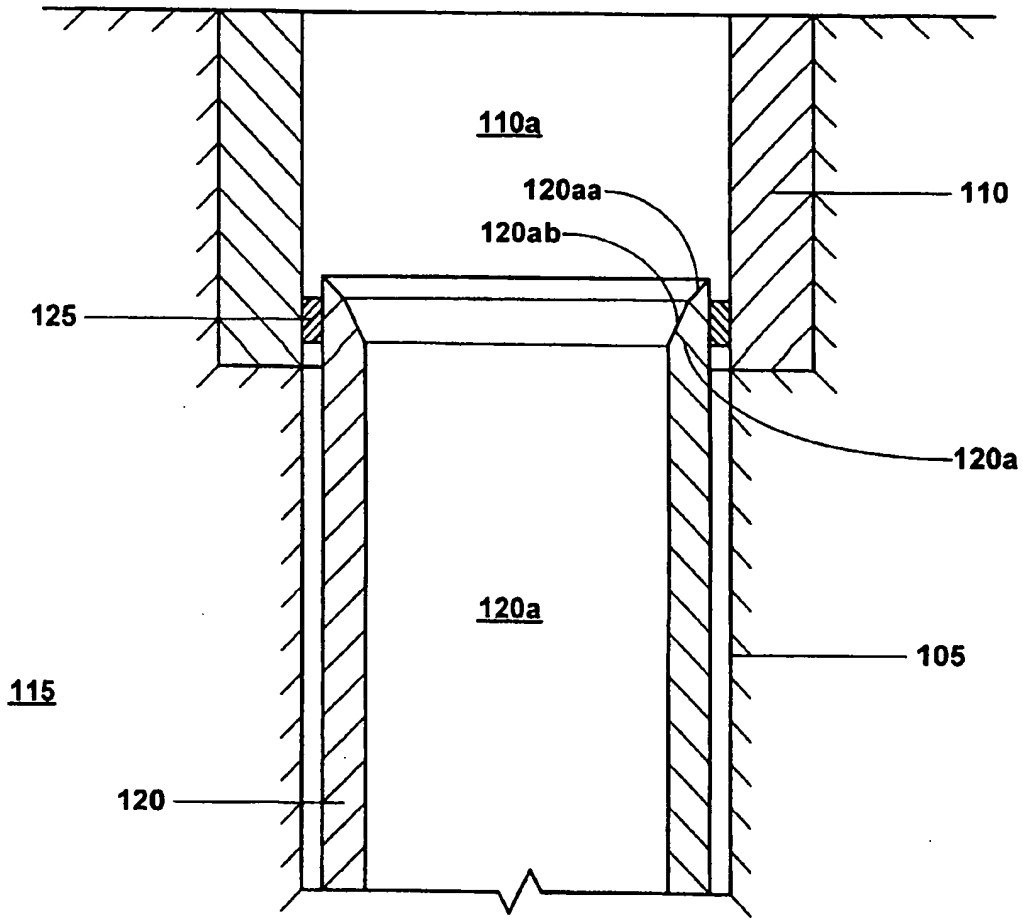


Fig. 2

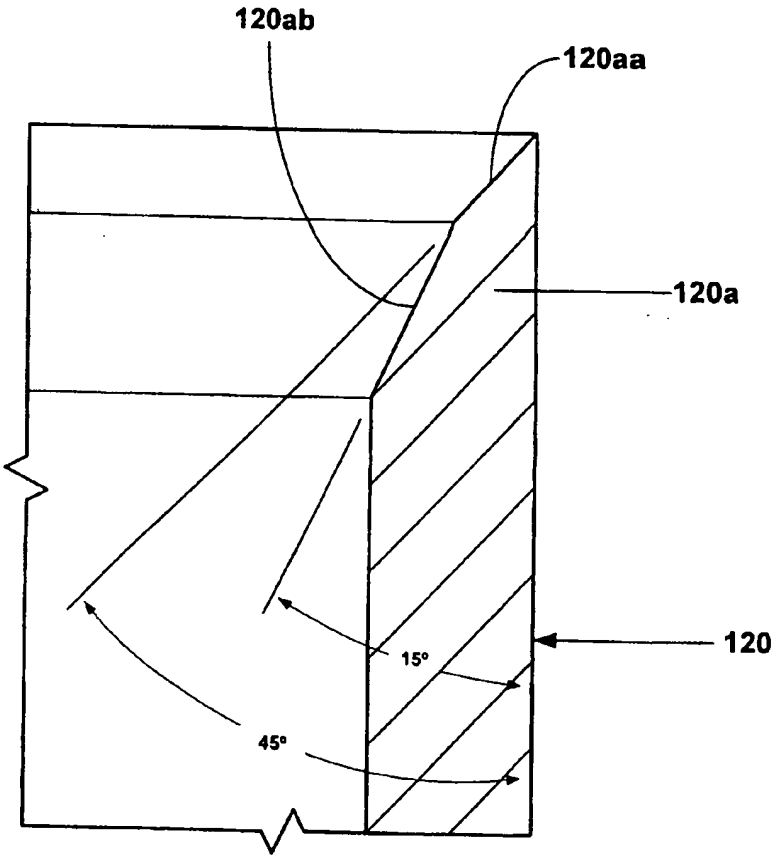
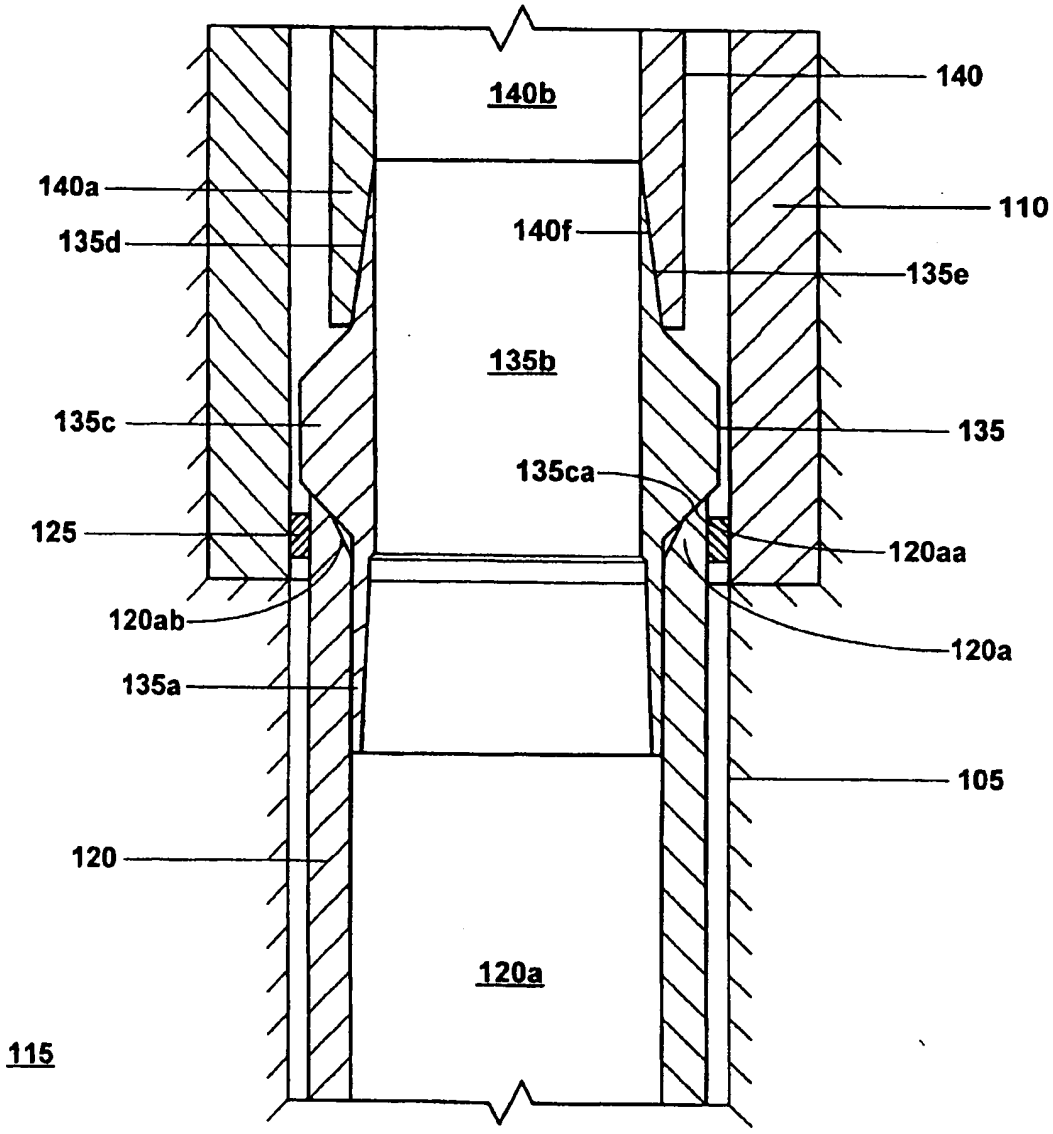


Fig. 2a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120a
115

Fig. 3

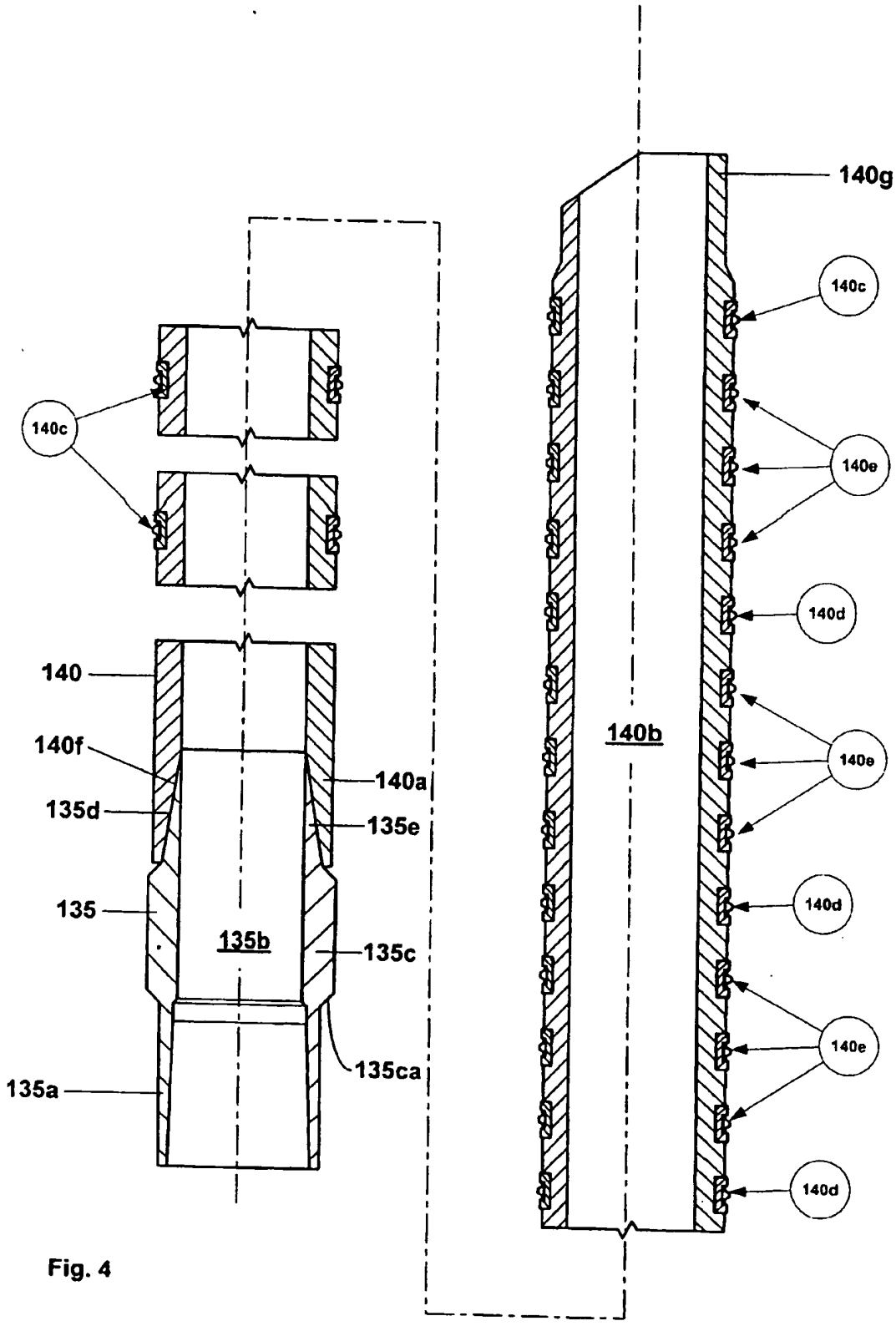
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Fig. 4

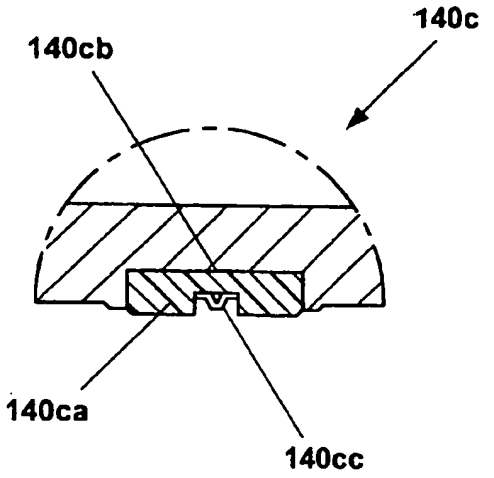

Fig. 4a

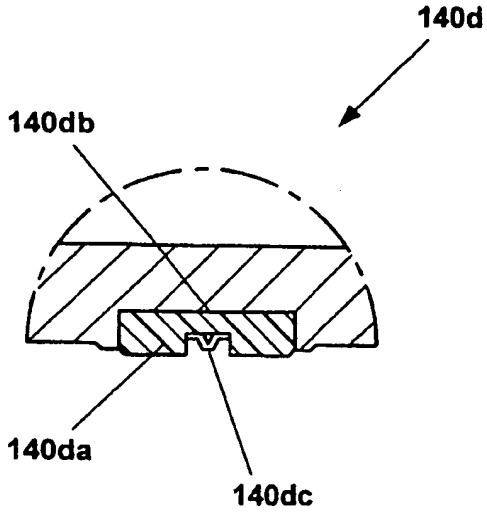

Fig. 4b

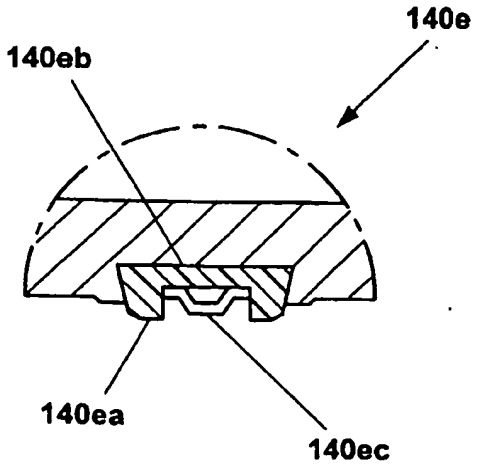

Fig. 4c

2401893

SEAL RECEPTACLE USING EXPANDABLE LINER HANGER

Cross Reference To Related Applications

[0001] The present application is the National Stage patent application filing for PCT patent application serial number PCT/US02/39425, attorney docket no. 25791.68.02, filed on December 27, 2001, that claimed the benefit of the filing dates of: (1) U.S. provisional patent application serial no. 60/343,674, attorney docket no. 25791.68, filed on 12/27/2001, the disclosure of all of which are incorporated herein by reference.

[0002] The present application is related to the following: (1) U.S. patent application serial no. 09/454,139, attorney docket no. 25791.03.02, filed on 12/3/1999, (2) U.S. patent application serial no. 09/510,913, attorney docket no. 25791.7.02, filed on 2/23/2000, (3) U.S. patent application serial no. 09/502,350, attorney docket no. 25791.8.02, filed on 2/10/2000, (4) U.S. patent application serial no. 09/440,338, attorney docket no. 25791.9.02, filed on 11/15/1999, (5) U.S. patent application serial no. 09/523,460, attorney docket no. 25791.11.02, filed on 3/10/2000, (6) U.S. patent application serial no. 09/512,895, attorney docket no. 25791.12.02, filed on 2/24/2000, (7) U.S. patent application serial no. 09/511,941, attorney docket no. 25791.16.02, filed on 2/24/2000, (8) U.S. patent application serial no. 09/588,946, attorney docket no. 25791.17.02, filed on 6/7/2000, (9) U.S. patent application serial no. 09/559,122, attorney docket no. 25791.23.02, filed on 4/26/2000, (10) PCT patent application serial no. PCT/US00/18635, attorney docket no. 25791.25.02, filed on 7/9/2000, (11) U.S. provisional patent application serial no. 60/162,671, attorney docket no. 25791.27, filed on 11/1/1999, (12) U.S. provisional patent application serial no. 60/154,047, attorney docket no. 25791.29, filed on 9/16/1999, (13) U.S. provisional patent application serial no. 60/159,082, attorney docket no. 25791.34, filed on 10/12/1999, (14) U.S. provisional patent application serial no. 60/159,039, attorney docket no. 25791.36, filed on 10/12/1999, (15) U.S. provisional patent application serial no. 60/159,033, attorney docket no. 25791.37, filed on 10/12/1999, (16) U.S. provisional patent application serial no. 60/212,359, attorney docket no. 25791.38, filed on 6/19/2000, (17) U.S. provisional patent application serial no. 60/165,228, attorney docket no. 25791.39, filed on 11/12/1999, (18) U.S. provisional patent application serial no. 60/221,443, attorney docket no. 25791.45, filed on 7/28/2000, (19) U.S. provisional patent application serial no. 60/221,645, attorney docket no. 25791.46, filed on 7/28/2000, (20) U.S. provisional patent application serial no. 60/233,638, attorney docket no. 25791.47, filed on 9/18/2000, (21) U.S. provisional patent application serial no. 60/237,334, attorney docket no. 25791.48, filed on 10/2/2000, (22) U.S. provisional patent application serial no. 60/270,007, attorney docket no. 25791.50, filed on 2/20/2001, (23) U.S. provisional patent application serial no. 60/262,434, attorney docket no. 25791.51, filed on 1/17/2001, (24) U.S.

provisional patent application serial no. 60/259,486, attorney docket no. 25791.52, filed on 1/3/2001, (25) U.S. provisional patent application serial no. 60/303,740, attorney docket no. 25791.61, filed on 7/6/2001, (26) U.S. provisional patent application serial no. 60/313,453, attorney docket no. 25791.59, filed on 8/20/2001, (27) U.S. provisional patent application serial no. 60/317,985, attorney docket no. 25791.67, filed on 9/6/2001, (28) U.S. provisional patent application serial no. 60/3318,386, attorney docket no. 25791.67.02, filed on 9/10/2001, (29) U.S. utility patent application serial no. 09/969,922, attorney docket no. 25791.69, filed on 10/3/2001, and (30) U.S. utility patent application serial no. 10/016,467, attorney docket no. 25791.70, filed on December 10, 2001, the disclosures of which are incorporated herein by reference.

Background of the Invention

[0003] This invention relates generally to oil and gas exploration, and in particular to isolating certain subterranean zones to facilitate oil and gas exploration.

[0004] During oil exploration, a wellbore typically traverses a number of zones within a subterranean formation. Some of these subterranean zones will produce oil and gas, while others will not. Further, it is often necessary to isolate subterranean zones from one another in order to facilitate the exploration for and production of oil and gas. Existing methods for isolating subterranean production zones in order to facilitate the exploration for and production of oil and gas are complex and expensive.

[0005] The present invention is directed to overcoming one or more of the limitations of the existing processes for isolating subterranean zones during oil and gas exploration.

Summary of the Invention

[0006] According to a first aspect of the present invention, there is provided an apparatus, comprising:

a subterranean formation defining a wellbore;

a tubular wellbore casing positioned within and coupled to the wellbore;

a first tubular liner positioned within the wellbore overlapping with and coupled to the wellbore casing;

a second tubular liner positioned within the wellbore and overlapping with and coupled to the first tubular liner;

wherein the second tubular liner is coupled to the first tubular liner by:

machining an end of the first tubular liner; and

inserting an end of the second tubular liner into the machined end of the first tubular liner; and

wherein the first tubular liner is coupled to the wellbore casing by radially expanding and

plastically deforming the first tubular liner into engagement with the wellbore casing.

According to another aspect of the present invention, there is provided a method for extracting fluidic materials from a subterranean formation including a wellbore that traverses the formation and a wellbore casing positioned within and coupled to the wellbore, comprising:

coupling an end of a tubular liner to an end of the wellbore casing;

machining an end of the tubular liner;

inserting an end of another tubular liner into the machined end of the tubular liner;

sealing the interface between the other tubular liner and the wellbore casing; and

radially expanding and plastically deforming the tubular liner into engagement with the wellbore casing.

According to another aspect of the present invention there is provided a system or extracting fluidic materials from a subterranean formation including a wellbore that traverses the formation and a wellbore casing positioned within and coupled to the wellbore, comprising:

means for coupling an end of a tubular liner to an end of the wellbore casing;

means for machining an end of the tubular liner;

means for inserting an end of another tubular liner into the machined end of the tubular liner;

means for sealing the interface between the other tubular liner and the wellbore casing; and

means for radially expanding and plastically deforming the tubular liner into engagement with the wellbore casing.

According to another aspect of the present invention, there is provided an apparatus comprising a subterranean formation defining a wellbore that includes a wellbore casing positioned within and coupled to the wellbore and a tubular liner coupled to an end of the wellbore casing, a method of conveying fluidic materials to and from the tubular liner, comprising:

radially expanding and plastically deforming the tubular liner into engagement with the wellbore casing;

machining the end of the tubular liner;

inserting and supporting an end of another tubular liner in the machined end of the tubular liner; and

conveying fluidic materials to and from the tubular liner using the other tubular liner.

Preferably, the other end of the tubular liner extends through the wellbore casing.

Preferably, the method further comprises fluidicly sealing the interface between the other end of the tubular liner and the wellbore casing.

According to another aspect of the present invention, there is provided a method for creating a downhole seal between a first tubular and a second tubular, the first and second tubulars each having a top end and a bottom end, comprising:

positioning the first tubular at a selected depth within the wellbore;

expanding the inner diameter of the top end of the first tubular;

machining the top end of the first tubular;

running the second tubular into the wellbore; and

mating the bottom end of the second tubular into the machined top end of the first tubular, the bottom end of the second tubular being configured to sealingly land into the expanded and machined inner diameter of the top end of the first tubular, thereby creating a fluid seal between the first and second tubulars.

Preferably, the outer surface of the bottom end of the second tubular has a sealing element for facilitating the fluid seal between the first and second tubulars.

Preferably, expanding the inner diameter of the top end of the first tubular is accomplished by applying a radial force to the inner surface of the first tubular so as to radially expand the inner surface of the first tubular from a first diameter to a second diameter along a selected length at the top end of the first tubular, thereby forming a polished bore receptacle.

Preferably, the radial force applied to the first tubular is applied by forcing a swaged cone a distance into the top end of the first tubular, the swaged cone having a diameter at its lower end that is smaller than the diameter at the widest point of the swaged cone and that is also smaller than the inner diameter of the first tubular.

Preferably, the first tubular defines a string of casing;

the wellbore further comprises at least one upper string of casing set in the wellbore immediately above the first tubular, the upper string of casing also having a top end and a bottom end;

the top end of the first tubular is positioned in the wellbore such that the top end of the first tubular overlaps with the bottom end of the upper string of casing; and

the second tubular defines a string of production tubing.

Preferably, the method further comprises the step of removing the swaged cone from the wellbore after the polished bore receptacle has been created.

According to another aspect of the present invention, there is provided a method for creating a polished bore receptacle at the upper end of a string of casing comprising:

positioning the string of casing at a selected depth within a wellbore;

running a swaged cone into the wellbore at the lower end of a working string, the swaged cone having a diameter at its lower end that is smaller than the diameter at the widest

point of the swaged cone and that is also smaller than the inner diameter of the string of casing;

forcing the swaged cone downward into the upper end of the string of casing along a desired distance, thereby expanding the inner surface of the upper end of the string of casing from a first diameter to a second diameter such that the second diameter is dimensioned to sealingly receive a lower end of a string of production tubing;

removing the swaged cone from the wellbore;

machining the top end of the string of casing;

running the string of production tubing into the wellbore after the cone has been removed; and

landing the bottom end of the string of production tubing into the expanded and machined top end of the string of casing, the bottom end of the string of production tubing being configured to sealingly land into the expanded inner diameter of the string of casing, thereby creating a fluid seal between the string of casing and the string of production tubing.

Preferably, the lower end of the string of production tubing has a sealing element around an outer surface for facilitating the fluid seal between the expanded inner surface of the upper end of the string of casing, and the lower end of the string of production tubing.

Preferably, the sealing element comprises a plurality of elastomeric rings circumferentially disposed about the outer surface of the lower end of the production tubing.

Brief Description of the Drawings

[0010] FIG. 1 is a fragmentary cross-sectional view illustrating a liner coupled to a preexisting wellbore casing.

[0011] Fig. 2 is a fragmentary cross sectional illustration of the liner of Fig. 1 after machining the end of the liner.

[0012] Fig. 2a is a fragmentary cross sectional illustration of the machined end of the liner of Fig. 2.

[0013] Fig. 3 is a fragmentary cross sectional illustration of the insertion of a seal assembly into the machined end of the liner of Fig. 2.

[0014] Fig. 4 is a fragmentary cross sectional of the seal assembly of Fig. 3.

[0015] Fig. 4a is a fragmentary cross sectional illustration of one of the seals of the seal assembly of Fig. 4.

[0016] Fig. 4b is a fragmentary cross sectional illustration of another one of the seals of the seal assembly of Fig. 4.

[0017] Fig. 4c is a fragmentary cross sectional illustration of another one of the seals of the seal assembly of Fig. 4.

Detailed Description of the Illustrative Embodiments

[0018] Referring to Fig. 1, a wellbore 105 including a casing 110 that defines a passage 110a is positioned in a subterranean formation 115. During exploration of the subterranean formation 115, the wellbore 105 may be extended in a well known manner. A tubular liner 120 that defines a

passage 120a including an elastomeric seal 125 may then be positioned in the extended portion of the wellbore 105 and coupled to the end of the casing 110 by radially expanding and plastically deforming the upper end of the tubular liner 120 into engagement with the lower end of the casing. In this manner, the elastomeric seal 125 is compressed into engagement with the casing 110 thereby creating sufficient frictional force to seal the interface between the liner 120 and the casing and support the weight of the liner using the casing.

[0019] In several exemplary embodiments, the liner 120 is radially expanded and plastically deformed into engagement with the casing 110 in a conventional manner and/or using one or more of the methods and apparatus disclosed in one or more of the following: (1) U.S. patent application serial no. 09/454,139, attorney docket no. 25791.03.02, filed on 12/3/1999, (2) U.S. patent application serial no. 09/510,913, attorney docket no. 25791.7.02, filed on 2/23/2000, (3) U.S. patent application serial no. 09/502,350, attorney docket no. 25791.8.02, filed on 2/10/2000, (4) U.S. patent application serial no. 09/440,338, attorney docket no. 25791.9.02, filed on 11/15/1999, (5) U.S. patent application serial no. 09/523,460, attorney docket no. 25791.11.02, filed on 3/10/2000, (6) U.S. patent application serial no. 09/512,895, attorney docket no. 25791.12.02, filed on 2/24/2000, (7) U.S. patent application serial no. 09/511,941, attorney docket no. 25791.16.02, filed on 2/24/2000, (8) U.S. patent application serial no. 09/588,946, attorney docket no. 25791.17.02, filed on 6/7/2000, (9) U.S. patent application serial no. 09/559,122, attorney docket no. 25791.23.02, filed on 4/26/2000, (10) PCT patent application serial no. PCT/US00/18635, attorney docket no. 25791.25.02, filed on 7/9/2000, (11) U.S. provisional patent application serial no. 60/162,671, attorney docket no. 25791.27, filed on 11/1/1999, (12) U.S. provisional patent application serial no. 60/154,047, attorney docket no. 25791.29, filed on 9/16/1999, (13) U.S. provisional patent application serial no. 60/159,082, attorney docket no. 25791.34, filed on 10/12/1999, (14) U.S. provisional patent application serial no. 60/159,039, attorney docket no. 25791.36, filed on 10/12/1999, (15) U.S. provisional patent application serial no. 60/159,033, attorney docket no. 25791.37, filed on 10/12/1999, (16) U.S. provisional patent application serial no. 60/212,359, attorney docket no. 25791.38, filed on 6/19/2000, (17) U.S. provisional patent application serial no. 60/165,228, attorney docket no. 25791.39, filed on 11/12/1999, (18) U.S. provisional patent application serial no. 60/221,443, attorney docket no. 25791.45, filed on 7/28/2000, (19) U.S. provisional patent application serial no. 60/221,645, attorney docket no. 25791.46, filed on 7/28/2000, (20) U.S. provisional patent application serial no. 60/233,638, attorney docket no. 25791.47, filed on 9/18/2000, (21) U.S. provisional patent application serial no. 60/237,334, attorney docket no. 25791.48, filed on 10/2/2000, (22) U.S. provisional patent application serial no. 60/270,007, attorney docket no. 25791.50, filed on 2/20/2001; (23) U.S. provisional patent application serial no. 60/262,434, attorney docket no. 25791.51, filed on

1/17/2001; (24) U.S, provisional patent application serial no. 60/259,486, attorney docket no. 25791.52, filed on 1/3/2001; (25) U.S. provisional patent application serial no. 60/303,740, attorney docket no. 25791.61, filed on 7/6/2001; (26) U.S. provisional patent application serial no. 60/313,453, attorney docket no. 25791.59, filed on 8/20/2001; (27) U.S. provisional patent application serial no. 60/317,985, attorney docket no. 25791.67, filed on 9/6/2001; (28) U.S. provisional patent application serial no. 60/3318,386, attorney docket no. 25791.67.02, filed on 9/10/2001; (29) U.S. utility patent application serial no. 09/969,922, attorney docket no. 25791.69, filed on 10/3/2001; and (30) U.S. utility patent application serial no. 10/016,467, attorney docket no. 25791.70, filed on December 10, 2001, the disclosures of which are incorporated herein by reference.

[0020] In an exemplary embodiment, as illustrated in Figs. 2 and 2a, the upper end 120a of the liner 120 is then machined to provide a first beveled portion 120aa and a second beveled portion 120ab. In an exemplary embodiment, the angle of attack of the first beveled portion 120aa is about 45° and the angle of attack of the second beveled portion 120ab is about 15°.

[0021] As illustrated in Figs. 3 and 4, an end 135a of a tubular locator 135 that defines a passage 135b and includes a flange 135c and an external threaded connection 135d at another end 135e is then inserted into the upper end 120a of the liner 120. The flange 135c further includes a tapered end face 135ca that mates with the first portion 120aa of the machined upper end 120a of the liner 120. In this manner, the tubular locator 135 mates with and is supported by the upper end 120a of the liner 120. Furthermore, the compound angular profile of the combination of the first and second portions, 120aa and 120ab, of the machined upper end 120a of the liner 120 facilitates the insertion of the end 135a of the tubular location 135 within the upper end of the liner.

[0022] An end 140a of a tubular seal assembly 140 that defines a passage 140b and includes external seals 140c, 140d, and 140e, is removably coupled to the external threaded connection 135d of the end 135e of the tubular locator 135 by an internal threaded connection 140f. A portion of the other end 140g of the tubular seal assembly 140 is tapered at approximately an angle of about 45 degrees in order to facilitate the insertion and removal of equipment.

[0023] As illustrated in Fig. 4a, in an exemplary embodiment, the external seal 140c includes an elastomeric seal 140ca that is retained within an external groove 140cb by a retaining element 140cc. In an exemplary embodiment, the external seals 140c fluidicly seal the interface between the tubular seal assembly 140 and the wellbore casing 110.

[0024] As illustrated in Fig. 4b, in an exemplary embodiment, the external seal 140d includes an elastomeric seal 140da that is retained within an external groove 140db by a retaining element 140dc. In an exemplary embodiment, the external seals 140d fluidicly seal the interface

between the tubular seal assembly 140 and the wellbore casing 110.

[0025] As illustrated in Fig. 4c, in an exemplary embodiment, the external seal 140e includes an elastomeric seal 140ea that is retained within an external groove 140eb by a retaining element 140ec. In an exemplary embodiment, the external seals 140e fluidicly seal the interface between the tubular seal assembly 140 and the wellbore casing 110.

[0026] During operation, in an exemplary embodiment, after the liner 120 has been radially expanded and plastically deformed into engagement with the casing 110, the upper end 120a of the liner 120 is then machined to provide the first beveled portion 120aa and the second beveled portion 120ab. The tubular locator 135 and tubular seal assembly 140 are then inserted into the interior of the casing 110, and the end 135a of the tubular location is inserted into the upper end 120a of the tubular liner 120. The external seals 140c, 140d, and 140e of the tubular seal assembly then fluidicly seal the interface between the tubular seal assembly and the casing. In this manner, the tubular locator 135 and the tubular seal assembly 140 provide a pressure sealed tubular liner for conveying fluidic materials to and from the tubular liner 120. In this manner, the need for a tie-back liner may be eliminated thereby providing a cost effective alternative to conventional methods and apparatus for providing a pressure sealed tubular liner.

[0027] An apparatus has been described that includes a subterranean formation defining a wellbore, a tubular wellbore casing positioned within and coupled to the wellbore, a first tubular liner positioned within the wellbore overlapping with and coupled to the wellbore casing, and a second tubular liner positioned within the wellbore and overlapping with and coupled to the first tubular liner. The second tubular liner is coupled to the first tubular liner by machining an end of the first tubular liner, and inserting an end of the second tubular liner into the machined end of the first tubular liner. In an exemplary embodiment, the first tubular liner is coupled to the wellbore casing by radially expanding and plastically deforming the first tubular liner into engagement with the wellbore casing.

[0028] A method for extracting fluidic materials from a subterranean formation including a wellbore that traverses the formation and a wellbore casing positioned within and coupled to the wellbore has also been described that includes coupling an end of a tubular liner to an end of the wellbore casing, machining an end of the tubular liner, inserting an end of another tubular liner into the machined end of the tubular liner, and sealing the interface between the other tubular liner and the wellbore casing. In an exemplary embodiment, the method further includes radially expanding and plastically deforming the tubular liner into engagement with the wellbore casing.

[0029] A system for extracting fluidic materials from a subterranean formation including a wellbore that traverses the formation and a wellbore casing positioned within and coupled to the wellbore

has also been described that includes means for coupling an end of a tubular liner to an end of the wellbore casing, means for machining an end of the tubular liner, means for inserting an end of another tubular liner into the machined end of the tubular liner, and means for sealing the interface between the other tubular liner and the wellbore casing. In an exemplary embodiment, the system further includes means for radially expanding and plastically deforming the tubular liner into engagement with the wellbore casing.

[0030] In an apparatus comprising a subterranean formation defining a wellbore that includes a wellbore casing positioned within and coupled to the wellbore and a tubular liner coupled to an end of the wellbore casing, a method of conveying fluidic materials to and from the tubular liner has also been described that includes machining the end of the tubular liner, inserting and supporting an end of another tubular liner in the machined end of the tubular liner, and conveying fluidic materials to and from the tubular liner using the other tubular liner. In an exemplary embodiment, the other end of the tubular liner extends through the wellbore casing. In an exemplary embodiment, the method further includes fluidicly sealing the interface between the other end of the tubular liner and the wellbore casing.

[0031] The present illustrative embodiments of the invention provide a number of advantages. For example, using the machined upper end 120a of the liner 120 as a seal receptacle eliminates more costly and complicated conventional systems for providing a seal receptacle. Furthermore, the use of the tubular locator 135 and the tubular seal assembly 140 eliminates the more costly and complicated tie-back liner. As a result, the present illustrative embodiments provide a sophisticated yet less complex system for providing a pressure sealed tubular liner for conveying fluidic materials to and from the tubular liner 120.

[0032] It is understood that variations may be made in the foregoing without departing from the scope of the invention. For example, while the present system has been described in for use with a tubular liner 120 that has been radially expanded and plastically deformed into engagement with the casing 110, the teachings of the present embodiments may also be applied to tubular liners that are coupled to a preexisting casing without radial expansion and plastic deformation. Furthermore, while illustrative embodiments of the present system have been presented for extracting oil and gas from a subterranean formation, the teachings of the present embodiments may also be applied to the extraction of geothermal energy from subterranean formations. In addition, in several exemplary embodiments, the seals 140c, 140d, and/or 140e, seal the interface between the tubular seal assembly 140 and the wellbore casing 110.

[0033] Although illustrative embodiments of the invention have been shown and described, a wide range of modification, changes and substitution is contemplated in the foregoing disclosure. In

some instances, some features of the present invention may be employed without a corresponding use of the other features. Accordingly, it is appropriate that the appended claims be construed broadly and in a manner consistent with the scope of the invention.

CLAIMS

1. An apparatus, comprising:

a subterranean formation defining a wellbore;

a tubular wellbore casing positioned within and coupled to the wellbore;

a first tubular liner positioned within the wellbore overlapping with and coupled to the wellbore casing;

a second tubular liner positioned within the wellbore and overlapping with and coupled to the first tubular liner;

wherein the second tubular liner is coupled to the first tubular liner by:

machining an end of the first tubular liner; and

inserting an end of the second tubular liner into the machined end of the first tubular liner; and

wherein the first tubular liner is coupled to the wellbore casing by radially expanding and plastically deforming the first tubular liner into engagement with the wellbore casing.

2. A method for extracting fluidic materials from a subterranean formation including a wellbore that traverses the formation and a wellbore casing positioned within and coupled to the wellbore, comprising:

coupling an end of a tubular liner to an end of the wellbore casing;

machining an end of the tubular liner;

inserting an end of another tubular liner into the machined end of the tubular liner;

sealing the interface between the other tubular liner and the wellbore casing; and

radially expanding and plastically deforming the tubular liner into engagement with the wellbore casing.

3. A system for extracting fluidic materials from a subterranean formation including a wellbore that traverses the formation and a wellbore casing positioned within and coupled to the wellbore, comprising:

means for coupling an end of a tubular liner to an end of the wellbore casing;

means for machining an end of the tubular liner;

means for inserting an end of another tubular liner into the machined end of the tubular liner;

means for sealing the interface between the other tubular liner and the wellbore casing;

and

means for radially expanding and plastically deforming the tubular liner into engagement with the wellbore casing.

4. In an apparatus comprising a subterranean formation defining a wellbore that includes a wellbore casing positioned within and coupled to the wellbore and a tubular liner coupled to an end of the wellbore casing, a method of conveying fluidic materials to and from the tubular liner, comprising:

radially expanding and plastically deforming the tubular liner into engagement with the wellbore casing;

machining the end of the tubular liner;

inserting and supporting an end of another tubular liner in the machined end of the tubular liner; and

conveying fluidic materials to and from the tubular liner using the other tubular liner.

5. The method of claim 4, wherein the other end of the tubular liner extends through the wellbore casing.

6. The method of claim 5, further comprising:

fluidicly sealing the interface between the other end of the tubular liner and the wellbore casing.

7. A method for creating a downhole seal between a first tubular and a second tubular, the first and second tubulars each having a top end and a bottom end, comprising:

positioning the first tubular at a selected depth within the wellbore;

expanding the inner diameter of the top end of the first tubular;

machining the top end of the first tubular;

running the second tubular into the wellbore; and

mating the bottom end of the second tubular into the machined top end of the first tubular, the bottom end of the second tubular being configured to sealingly land into the expanded and machined inner diameter of the top end of the first tubular, thereby creating a fluid seal between the first and second tubulars.

8. The method for creating a downhole seal between a first tubular and a second tubular of claim 7, wherein the outer surface of the bottom end of the second tubular has a sealing

element for facilitating the fluid seal between the first and second tubulars.

9. The method for creating a downhole seal between a first tubular and a second tubular of claim 8, wherein expanding the inner diameter of the top end of the first tubular is accomplished by applying a radial force to the inner surface of the first tubular so as to radially expand the inner surface of the first tubular from a first diameter to a second diameter along a selected length at the top end of the first tubular, thereby forming a polished bore receptacle.

10. The method for creating a downhole seal between a first tubular and a second tubular of claim 9, wherein the radial force applied to the first tubular is applied by forcing a swaged cone a distance into the top end of the first tubular, the swaged cone having a diameter at its lower end that is smaller than the diameter at the widest point of the swaged cone and that is also smaller than the inner diameter of the first tubular.

11. The method for creating a downhole seal between a first tubular and a second tubular of claim 10, wherein

the first tubular defines a string of casing;

the wellbore further comprises at least one upper string of casing set in the wellbore immediately above the first tubular, the upper string of casing also having a top end and a bottom end;

the top end of the first tubular is positioned in the wellbore such that the top end of the first tubular overlaps with the bottom end of the upper string of casing; and

the second tubular defines a string of production tubing.

12. The method for creating a downhole seal between a first tubular and a second tubular of claim 11, further comprising the step of removing the swaged cone from the wellbore after the polished bore receptacle has been created.

13. A method for creating a polished bore receptacle at the upper end of a string of casing comprising:

positioning the string of casing at a selected depth within a wellbore;

running a swaged cone into the wellbore at the lower end of a working string, the swaged cone having a diameter at its lower end that is smaller than the diameter at the widest point of the swaged cone and that is also smaller than the inner diameter of the string of casing;

forcing the swaged cone downward into the upper end of the string of casing along a desired distance, thereby expanding the inner surface of the upper end of the string of casing from a first diameter to a second diameter such that the second diameter is dimensioned to sealingly receive a lower end of a string of production tubing;

removing the swaged cone from the wellbore;

machining the top end of the string of casing;

running the string of production tubing into the wellbore after the cone has been removed; and

landing the bottom end of the string of production tubing into the expanded and machined top end of the string of casing, the bottom end of the string of production tubing being configured to sealingly land into the expanded inner diameter of the string of casing, thereby creating a fluid seal between the string of casing and the string of production tubing.

14. The method for creating a polished bore receptacle at the upper end of a string of casing of claim 13, wherein the lower end of the string of production tubing has a sealing element around an outer surface for facilitating the fluid seal between the expanded inner surface of the upper end of the string of casing, and the lower end of the string of production tubing.

15. The method for creating a polished bore receptacle at the upper end of a string of casing of claim 14, wherein the sealing element comprises a plurality of elastomeric rings circumferentially disposed about the outer surface of the lower end of the production tubing.